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PENSOFT

New record of the rare *Gonatopus mariae* Martins, Lara, Perioto & Olmi, 2015 (Hymenoptera, Dryinidae) for the state of Espírito Santo, Brazil

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Abstract

Gonatopus mariae Martins, Lara, Perioto & Olmi, 2015, described from the state of São Paulo, is recorded for the first time in the state of Espírito Santo, Brazil, representing the first record of the genus and species from the state. The specimen was collected with a Malaise Dossel trap and deposited at the Entomological Collection of the Universidade Federal do Espírito Santo (Brazil). A diagnosis and illustration of this species are presented demonstrating morphological variation of the type material. A distribution map is also provided. *Gonatopus mariae* is a rare species and its distribution is probably restricted to the southeastern region of Brazil.

Keywords

Atlantic Forest, Gonatopodinae, Group-seven, Malaise Dossel trap, wasps.

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Introduction

Gonatopodinae is the most diverse subfamily of Dryinidae, with 556 described species in 11 genera, 8 of them recorded for the Neotropical region (Olmi and Virla 2014, Olmi and Xu 2015). The genus *Gonatopus* Ljungh, 1810 is the most diverse of Gonatopodinae with about 440 species described worldwide, including about 120 species from the Neotropical region, of which 32 species are present in Brazil (Olmi and Virla 2014, Martins et al. 2015a, 2015b, Martins 2018a). This genus comprises 12 groups of species: 9 groups for the Neotropical region, 5 of them in Brazil, of which "Group-seven" is the most diverse, comprising 61 species (Olmi and Virla 2014). In the last 40 years, the Dryinidae of Brazil were studied mainly by Olmi (1984, 1991, 2011), Coelho et al. (2011), Martins (2013), Olmi and Virla (2014), Versuti et al. (2014), Martins (2015, 2018a, 2018b), Martins et al. (2015a, 2015b), Martins and Krinski (2016), Martins and Domahovski (2017a, 2017b), and Martins et al. (submitted). Most species of Dryinidae are rare and usually only a few specimens are collected. In fact, *Gonatopus mariae* Martins, Lara, Perioto & Olmi, 2015, was described from the state of São Paulo (Brazil) based on only 2 specimens (Martins et al. 2015b).

The aims of this study are to report a new record of *G. mariae* for the state of Espírito Santo (Brazil) and to present morphological intraspecific variations in this species based on the third known specimen.

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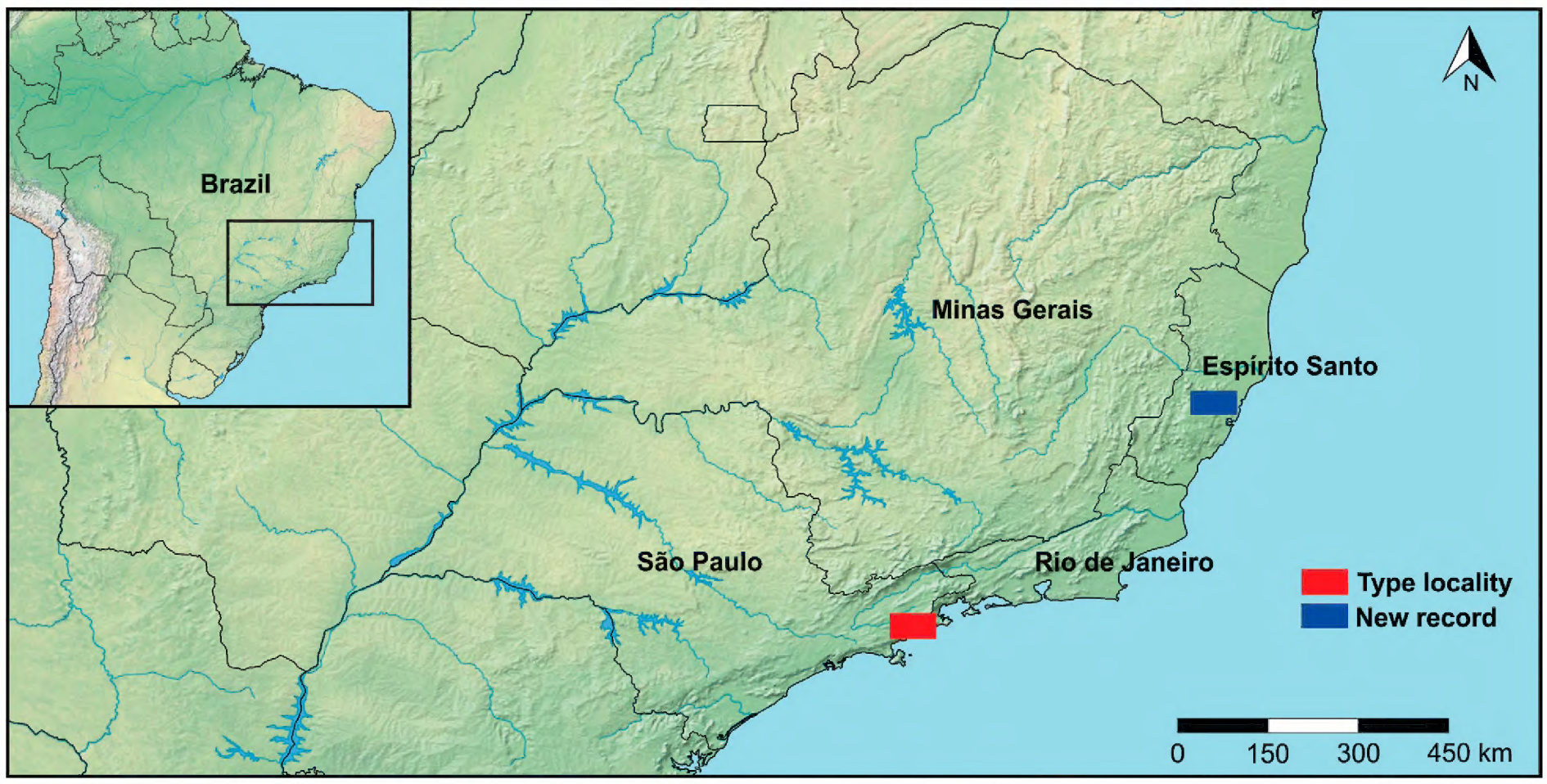

Figure 1. Geographic distribution of *Gonatopus mariae* Martins, Lara, Perioto & Olmi 2015. The highlighted area shows the physical map of the southeast region of Brazil. Red rectangle represents the holotype and paratype locality in the state of São Paulo and the blue rectangle represents the new record in the state of Espírito Santo, Brazil.

Methods

Gonatopus mariae was described from Brazil, (label data: São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia, 23.3216° S, 45.0953° W, Malaise trap, 22.x.2010, N.W. Perioto and team., leg.; Fig. 1). The third specimen presented here was collected in the Estação Biológica de Santa Lúcia, municipality of Santa Teresa, state of Espírito Santo (Fig. 1). The specimen was examined at the "Laboratório de Biologia Comparada de Hymenoptera" (LBCH) at "Universidade Federal do Paraná" using a Leica M125 stereomicroscope. Morphological terminology followed Olmi and Virla (2014). For the identification, keys proposed by Olmi and Virla (2014) and Martins et al. (2015b) were used, as well as comparisons between the original description and the type material deposited at "Laboratório de Sistemática e Bioecologia de Parasitoides e Predadores" (LRRP) Entomological Colection, municipality of Ribeirão Preto, São Paulo state, Brazil (N.W. Perioto, curator). For the diagnosis, the following abbreviations are used: POL = distance between the inner edges of the lateral ocelli; OL = distance between the inner edges of a lateral ocellus and the median ocellus; OOL = distance from the outer edge of a lateral ocellus to the compound eye. Photographs were obtained using a LEICA DFC295 digital camera attached to a stereoscopic microscope and processed with Zerene Stacker software (1.04 version build). The distribution map was produced using the website SimpleMappr (Shorthouse 2010). The figure and map were prepared using Adobe Photoshop (version 11.0). The examined specimen is deposited in the Entomological Collection of the Universidade Federal do Espírito Santo (UFES) Entomological Collection, Brazil.

Results

Examined material. 1 ♀, UFES number 160360, BRAZIL: ES, Santa Teresa, Est. Biol. Santa Lúcia, 19.9710°S, 040.5371°W, 06–09.xi.2009, M.T. Tavares & C. Oliveira, Malaise Dossel (UFES) (Fig. 2).

Holotype: *Gonatopus mariae* Martins, Lara, Perioto & Olmi 2015: 457: ♀, Brazil, São Luiz do Paraitinga, Parque Estadual da Serra do Mar, Núcleo Santa Virgínia (LRRP).

Identification. Diagnosis of the female. Length 4.25 mm (Fig. 2). Body predominantly testaceous (Martins et al. 2015b: figs 2, 8), except mandible, clypeus and anterior region of face yellow-testaceous; antenna testaceous-darkened, except ventral region of scape yellow-testaceous; mesosoma testaceous; legs testaceous, except distal part of coxae, trochanters and tibiae darkened; metasoma black, except distal part testaceous (Fig. 2). Antenna clavate; antennomeres in the following proportions: 25:12:28:12:10:11:10:10:10:15. Head slightly excavated, shiny, granulate; frontal line complete; occipital carina present only behind lateral ocelli (Martins et al. 2015b: fig. 9); POL = 31; OL = 5; OOL = 20. Pronotum shiny, crossed by strong transverse impression (Martins et al. 2015b: figs 2, 10, 11). Mesoscutum with 2 lateral pointed apophyses (Martins et al. 2015b: fig. 10). Metanotum shiny. Propodeum with posterior surface strongly transversely striate (Fig. 2). Meso-metapleural suture distinct (Martins et al. 2015b: figs 2, 11). Protarsomeres in the following proportions: 35:8:14:35:56. Protarsomere 5 longer than enlarged claw (56:47). Enlarged claw with 1 small subapical tooth and 1 row of 7 bristles. Protarsomere 5 with 1 row of 5 bristles and 13 lamellae; distal apex with about 15 lamellae. Tibial spurs 1/0/1.

Figure 2. Female of *Gonatopus mariae* Martins, Lara, Perioto & Olmi 2015 (voucher, UFES 160360). Habitus in lateral view. Scale bar: 1.0 mm.

Table1. Morphological variation between the examined specimen and the holotype and paratye of *Gonatopus mariae* Martins, Lara, Perioto & Olmi 2015.

Morphological features	***Gonatopus mariae* Martins, Lara, Perioto & Olmi 2015**	
	São Luiz do Paraitinga, São Paulo (holotype)	**Santa Teresa, Espírito Santo**
Anterior margin of clypeus	Brown	Yellow-testaceous
Color of legs	Brown, except part of procoxa and protrocanter testaceous	Testaceous, except part of procoxa and protrochanter testaceous darkened
Number of bristles on enlarged claw	6 or 7 teeth	7 teeth

Remarks. This specimen is very similar to the holotype and paratype (Martins et al. 2015b: see fig. 8 for reference), with only a few variations (Table 1; Fig. 2).

Discussion

Gonatopus mariae was previously known only from its type locality (Martins et al. 2015b) and has not been found in any of the Brazilian collections visited by the author. Here, a single female of *G. mariae* is reported for the first time for the state of Espírito Santo (Brazil). Although this specimen presents color differences when compared to the holotype and paratype, this can be considered intraspecific variation, as coloration does not seem to be a crucial character for species delimitation in Dryinidae in different geographic regions. Until now, species of *Gonatopus* have not been recorded from Espírito Santo, and for Gonatopodinae, only 2 species of the genus *Neodryinus* Perkins have been recorded: *N. trinitatis* Richards 1951 and *N. villemantae* Olmi 2003 (Olmi and Virla 2014). Most Gonatopodinae females are apterous, except for the genera *Adryinus* (Benoite) and *Neodryinus* which are winged (Olmi and Virla 2014). By the absence of wings, they are commonly found in grasses and shrubs near the soil and, therefore, commonly collected with soil traps such as yellow pan traps, sweep and interceptation traps. Of all the collection methods, the most effective traps to collect dryinids are yellow pan traps, interceptation traps, sweep nets and Malaise traps. However, females of *Gonatopus* are apterous and more frequently collected using sweeping techniques, being rarely collected with Malaise traps and Malaise Dossel (Martins 2013, Versuti et al. 2014, Olmi and Virla 2014, Martins and Domahovski 2017a, 2017b). More collections should be performed with different traps, primarily the most efficient for the dryinids and especially for genus *Gonatopus* to sample the diversity and distribution of this genus in Brazil (Martins et al. submitted).

Due to its great diversity of species and hosts, *Gonatopus* may be considered an important natural enemy of different Auchenorrhyncha (Hemiptera), some of them being considered pests of important cultures (Guglielmino et al. 2013, Martins et al. submitted). *Gonatopus* species are associated with 7 families of Auchenorrhyncha: Acanaloniidae, Cicadellidae, Delphacidae, Flatidae,

Issidae, Lophopidae, Tropiduchidae (Guglielmino et al. 2013, Martins and Domahovski 2017a, 2017b, Martins et al. submitted). The distribution records and the knowledge of the collection methods are of great importance for the study of Dryinidae. This information makes it possible to collect the parasitized host leafhoppers and to rear them until the emergence of the adults.

Little is known about the biology of *Gonatopus* in Brazil and new studies and collections could unveil important associations of Dryinidae with their hosts, hence the importance of natural environment's conservation. Recently, the author together with A.C. Domahovski collected more than 800 nymphs and adults of parasitized Auchenorrhyncha in a preserved area in the state of Paraná, Brazil (Martins and Domahovski 2017a, 2017b, Martins 2018b, Martins et al. submitted). This shows the importance of natural areas for the maintenance of ecosystems, especially to preserve species of animals that can act as biological control of other organisms. Little is known about the distribution of *G. mariae*, although the species is probably restricted to the Atlantic forest in southeastern Brazil (Martins et al. 2015b).

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